is found that the assumption which best agrees with experimental evidence is that the external action of the atom which is electro-positive is equivalent to a doublet and a positive charge both situated within the atom.—Prof. W. **Peddie**: The thermo-dynamics of unstable states. It was pointed out that, although the usual thermo-dynamical definition of absolute temperature applies in all practical cases, the second definition, recently indicated by Sir Joseph Larmor as formally satisfying Carnot's conditions, has an interesting theoretical application in the case of unstable states of the working substance.

PARIS.

Academy of Sciences, May 19.—M. Leon Guignard in the chair.—G. **Humbert**: The measure of classes of ternary positive quadratic forms of given determinant. —A. **Gautier**: The influence of fluorides on vegetation. Preliminary trials in garden-pots. Of twelve species cultivated under similar conditions, with and without addition of fluorides, seven showed increased growth in presence of fluorides, three were indifferent, and three gave lower yields.—C. **Guichard**: A mode of generation of isothermal surfaces with plane lines of curvature in a system.—M. **Tilho**: A scientific expedition of the Institute of France in Central Africa (Tibesti, Borku, Ennedi).—M. Edouard Goursat was elected a member of the section of geometry in succession to M. Emile Picard, elected permanent secretary.—G. **Julia**: Integral or meromorphic functions.—E. **Kogbetliantz**: The developments of Jacobi.—H. **Muraour**: The determination of temperatures reached in explosive reactions. Both the methods in use presuppose that the composition of the gases at the moment of explosion is known. The temperature determined varies according as the methane is assumed to exist at the moment of explosion or to be formed during the cooling. Experiments with a modified bomb are described, and these prove that the greater part, if not the whole, of the methane is formed during the cooling period.—M. H. **Robert**: A new laboratory form of fractionating column and the measurement of its efficiency. The lower part of the column, a diagram of which is given, is vacuum-jacketed, whilst a similar upper column is cooled externally by a controlled air-current; the thermometer is surrounded by a vapour-jacket. Examples of the remarkable efficiency of the column are given. Pure hexahydrotoluene was isolated from Borneo petrol; pentane, hexane, and heptane from American petrol; acetic anhydride from its mixture with acetic acid.—G. **Claude**: An important consequence of the commercial synthesis of ammonia. Ammonium chloride has been proved by Georges Ville to be capable of replacing ammonium sulphate as a manure, and carries a higher percentage of ammonia. If in the ammonia-soda process the sodium bicarbonate and ammonium chloride are collected separately, the latter is available as manure, the chlorine of the salt is utilised, and the consumption of sulphuric acid avoided.—P. **Lesage**: The stabilisation of characters in plants grown in presence of salt.—H. **Coupin**: The place where water is absorbed by the root. From experiments detailed the conclusion is drawn that the root absorbs water exclusively through its tip, and not through the root-hairs.—M. **Dallori**: The Coal Measures on the coast of the province of Oran.—J. **Lévine**: Two hundred and twenty years of (meteorological) observations in Paris.—G. **Lusk**: The comparative calorimetry of the ingestion of meat, lactic acid, and alanine in the animal.—A. L. **Herrera**: The pseudo-organisms of calcium fluosilicates.—E. **Bourquelot** and M. **Bridel**: The biochemical synthesis of cellobiose with the aid of emulsin.—E. **Kohn-Abrest**: Apparatus for the rapid analysis of confined air and unhealthy atmospheres.

CAPE TOWN.

Royal Society of South Africa, April 16.—Dr. J. D. F. Gilchrist, president, in the chair.—J. R. **Sutton**: Some controversial notes on the diamond. The author discusses the spontaneous breaking of diamonds and reaffirms his previous conclusions on the subject. It is claimed that there is no fundamental difference of process between the spontaneous breaking of a pure colourless crystal containing an inclusion of foreign mineral and that of opaque or clouded diamond. The probable derivation of distorted diamonds (pseudo-cleavage) from groups and clusters is also considered. The hardness of the diamond is generally over-estimated.

CALCUTTA.

Asiatic Society of Bengal, May 7.—N. **Annandale** and H. G. **Carter**: Notes on the vegetation of Seistan. The paper is based primarily on a collection of plants made, mainly in desert country and in the Hamun-i-Helmand or lake basin of Seistan, in November and December, 1918. A list of these plants is given and an attempt made to estimate the more conspicuous characters of the vegetation of several different types of environment, viz. the stony desert, the alluvial plain, the banks of streams of saline water, and the Hamun. Among the more interesting points brought out are the correlation between conspicuous colours and poisonous qualities in the plants of the desert, the different effects of soluble salts on the growth of different grasses, and the production of stiff, bayonet-like leaves in the same group in halophytic conditions.

BOOKS RECEIVED.

Mathematical Papers for Admission into the Royal Military Academy and the Royal Military College and Papers in Elementary Engineering for Naval Cadetships for the years 1909–18. Edited by R. M. Milne. (London: Macmillan and Co., Ltd., 1919.) 7*s*.

The Principles of Electric-Wave Telegraphy and Telephony. By Prof. J. A. Fleming. Fourth edition, revised. Pp. xvi+707+plates vii. (London: Longmans, Green, and Co., 1919.) 42*s*. net.

Mammalian Physiology: A Course of Practical Exercises. By Prof. C. S. Sherrington. Pp. xi+156+plates ix. (Oxford: At the Clarendon Press, 1919.) 12*s*. 6*d*. net.

Soils and Manures in New Zealand. By L. J. Wild. Pp. 134. (Auckland and London: Whitcombe and Tombs, Ltd., 1919.) 2*s*. 6*d*.

The America of To-day: Being Lectures Delivered at the Local Lectures Summer Meeting of the University of Cambridge, 1918. Edited by Dr. G. Lapsley. Pp. xxv+254. (Cambridge: At the University Press, 1919.) 12*s*. net.

The Evolution of the Dragon. By Prof. G. Elliot Smith. Pp. xx+234. (Manchester: At the University Press; London: Longmans, Green, and Co., 1919.) 10*s*. 6*d*. net.

The Chemists' Year-Book, 1918–19. Edited by F. W. Atack, assisted by L. Whinyates. Vol. i., pp. vi+422; vol. ii., pp. iv+423–1146. (London and Manchester: Sherratt and Hughes, 1919.) 15*s*. net two vols.

Studies in the Construction of Dams: Earthen and Masonry. Arranged on the Principle of Question and Answer for Engineering Students and Others. By Prof. E. R. Matthews. Pp. v+43. (London: Charles Griffin and Co., Ltd., 1919.) 4*s*. 6*d*. net.

National and International Right and Wrong: Two Essays. By Henry Sidgwick. With a preface by the Right Hon. Viscount Bryce. (Reprinted from

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the author's "Practical Ethics.") Pp. 77. (London: G. Allen and Unwin, Ltd., 1919.) 1*s*. 6*d*. net.

La Sélection Humaine. By Prof. C. Richet. (Bibliothèque Scientifique Internationale.) Pp. iii+262. (Paris: Librairie Félix Alcan, 1919.) 6.60 francs.

Atlante di Geografia Fisica, Politica ed Economica. By Prof. A. Mori. Fasc. 1, maps 18. (Torino, etc.: Ditta G. B. Paravia E.C., n.d.)

Birdland's Little People: Twelve Nature Studies for Children. By Capt. O. G. Pike. Pp. 123. (London: The Religious Tract Society, 1919.) 4*s*. 6*d*. net.

Barbed-Wire Disease: A Psychological Study of the Prisoner of War. By Dr. A. L. Vischer. Translated from the German. Pp. 84. (London: John Bale, Sons, and Danielsson, Ltd., 1919.) 3*s*. 6*d*. net.

Practical Physiological Chemistry. By S. W. Cole. With an introduction by Prof. F. G. Hopkins. Fifth edition. Pp. xvi+401. (Cambridge: W. Heffer and Sons, Ltd.; London: Simpkin, Marshall, Ltd., 1919.) 15*s*. net.

Problems of National Education. By Twelve Scottish Educationists. Edited by John Clarke. Pp. xxvi+368. (London: Macmillan and Co., Ltd., 1919.) 12*s*. net.

British Ferns and How to Identify Them. By J. H. Crabtree. Pp. 64. (London: The Epworth Press: J. Alfred Sharpe, n.d.) 1*s*. 6*d*. net.

Commercial Forestry in Britain: Its Decline and Revival. By E. P. Stebbing. Pp. vi+186. (London: John Murray, 1919.) 6*s*. net.

A Gentle Cynic: Being a Translation of the Book of Koheleth, commonly known as Ecclesiastes, stripped of Later Additions; also its Origin, Growth, and Interpretation. By Prof. M. Jastrow, jun. Pp. 255. (Philadelphia and London: J. B. Lippincott Co., 1919.) 9*s*. net.

Air Navigation: Notes and Examples. By Instructor-Capt. S. F. Card. Pp. vi+140. (London: Edward Arnold, 1919.) 10*s*. 6*d*. net.

The Voyage of a Vice-Chancellor. Pp. ix+139. (Cambridge: At the University Press, 1919.) 6*s*. net.

Influenza: A Discussion Opened by Sir Arthur Newsholme. Pp. 102. (London: Longmans, Green, and Co., n.d.) 3*s*. 6*d*. net.

Leeds University. Fourteenth Report, 1917–18. Pp. 111. (Leeds: Jowett and Sowry, Ltd., n.d.)

The Annual of the British School at Athens. No. xxii. Sessions 1916–17, 1917–18. Pp. vii+272+plates xi. (London: Macmillan and Co., Ltd., n.d.) 25*s*. net.

DIARY OF SOCIETIES.

THURSDAY, JUNE 12.

MATHEMATICAL SOCIETY, at 5.—Prof. G. A. Miller: Groups Involving Three and only Three Operators which are Square.—L. J. Mordell: Some Series whose *n*th Term Involves the Number of Classes of Binary Quadratics of Determinant −*w*.—Dr. W. P. Milne and Dr. D. G. Taylor: The Significance of Apolar Triangles in Elliptic Function Theory.—C. V. H. Rao: The General Theory of Ruled Surfaces.

OPTICAL SOCIETY, at 7.30.—S. D. Chalmers: The Recognition of Detail.

FRIDAY, JUNE 13.

PHYSICAL SOCIETY, at 5.—B. Van der Pol, jun.: A Comparison of the Wave-form of the Telephone Current produced by a Thermal Detector and a Rectifier in the Heterodyne Reception.—E. Wilson and E. F. Herroun: The Magnetic Properties of Varieties of Magnetite.

ROYAL ASTRONOMICAL SOCIETY, at 5.—Rev. J. G. Hagen: The Light Curves of Long-period Variables.—Miss E. Bellamy: A Curious Instance of Opposite Proper Motions.—H. S. Jones: Results obtained from Seven Years' Observations made with the Cookson Floating Zenith Telescope at the Royal Observatory, Greenwich.—J. H. Reynolds: The Distribution of Hydrogen and Nebulium in the Orion Nebula.—Rev. A. L. Cortie: The Spectrum of Nova Aquilæ, 1918, August 23 to October 23.—*Probable Paper:* W. Moss: The Eruptive Prominence of 1919, May 29—communicated by the Director of the Solar Physics Observatory, Cambridge.

MALACOLOGICAL SOCIETY, at 6.—G. C. Crick: *Ammonites navicula* (Mantell).—R. Bullen Newton: A Sandstone Cast of *Aturia aturi* (Basterot) from the Miocene of Western Australia.—A. S. Kennard and B. B. Woodward: The Generic Names for the Two British *Ellobiidae* [olim *Auriculidae*] *myosotis*, Draparnaud (=*denticulata*, Montagu) and *bidentata*, Montagu.—G. Despott: The Mollusca of Marsascirocco Harbour, Malta.—Tom Iredale: Notes on Polyplacophora. Part II.

MONDAY, JUNE 16.

VICTORIA INSTITUTE, at 4.30.—The Right Hon. the Earl of Halsbury, President: Annual Address.

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.

TUESDAY, JUNE 17.

BRITISH ASSOCIATION GEOPHYSICAL DISCUSSIONS (Royal Astronomica Society), at 5.—Dr. C. T. R. Wilson and J. H. Jeans: Atmospheric Electricity.

ROYAL STATISTICAL SOCIETY, at 5.15.—Mrs. Walter J. Barton: The Course of Women's Wages.

ZOOLOGICAL SOCIETY, at 5.30.—E. Heron-Allen and A. Earland: Exhibition of Lantern-slides Illustrating the Cultivation of *Verneuilina polystropha*, Reuss., in Hypertonic Sea-water and Gem-sand.—C. Morley: Equatorial and other Species and Genera of African Ichneumonidæ.—Dr. C. W. Andrews: A Description of New Species of Zeuglodons and Leathery Turtle from the Eocene of Southern Nigeria.—G. A. Boulenger: (1) A List of the Snakes of West Africa from Mauritania to the French Congo. (2) A List of the Snakes of North Africa.

MINERALOGICAL SOCIETY, at 5.30.—A. Brammall: Andalusite (Chiastolite): Its Genesis, Morphology, and Inclusions.—R. H. Rastall: The Mineral Composition of Oolitic Ironstones.—L. J. Spencer; Eighth List of Mineral Names.

ROYAL ANTHROPOLOGICAL INSTITUTE, at 8.15.—J. Reid Moir: Flint Implements from the "Middle" Glacial Gravel at Ipswich.

WEDNESDAY, JUNE 18.

ROYAL METEOROLOGICAL SOCIETY, at 5.—Col. Sir Charles Close: Note on the Rainfall at Southampton and London during a period of 57 years (1862–1918), with Special Reference to the Monthly Means.—Lieut. J. Logie: Note on Tornadoes.—Capt. D. Brunt: A Periodogram Analysis of the Greenwich Temperature Records.—Lieut. G. Green: The Propagation of Sound in the Atmosphere.

THURSDAY, JUNE 19.

INSTITUTION OF MINING ENGINEERS, at 11.—Lt.-Col. D. Dale Logan: (*a*) The Difficulties and Dangers of Mine-rescue Work on the Western Front, and Mining Operations carried out by Men wearing Rescue-apparatus; (*b*) Accidents due to Structural Defects of Apparatus or Injury to Apparatus, and the Future of the Proto Apparatus.—M. W. Blyth and L. T. O'Shea: The Examination of Coal in Relation to Coal-washing.—Prof. F. W. Hardwick: Reply to the Discussion on his Paper on the Training of Students in Coal-mining, with Special Reference to the Scheme of the Engineering Training Organisation.—W. Maurice: The Education of Colliery Managers for Administrative and Social Responsibilities.

ROYAL SOCIETY, at 4.30.—Bakerian Lecture. Hon. R. J. Strutt: Phosphorescence and Fluorescence in Metallic Vapours.

INSTITUTION OF MINING AND METALLURGY, at 5.30.—W. H. Goodchild: The Genesis of Igneous Ore Deposits.

CHEMICAL SOCIETY, at 8.

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